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tated with the sand pump, the water would flow over the top of it for several minutes at a time.

At 2,106 feet it was found impossible to drill any further. The water was so strong that the drill, which weighs three tons, floated with the hemp cable, and made no impression on the rock; 2,106 feet of casing were put into the well, with a patent stopper and a seed-bag, but the water could not be shut off. A pump was then tried, and for a week—day and night—200 gallons of water per minute were lifted out of the well. At the end of that time it was found that the depth of water had not been reduced five feet.

The water taken from the well was effervescent and hot. Gallons of it were taken away by people to be used as a medicine. Dr. Brown and other experts say that it contains very valuable properties.

I visited the well once, and sometimes twice, every day, from the time it was started until the finish, and the following is a list of the strata passed through, as furnished me by Mr. Reed:

<i>Depth of strata. Total.</i>		<i>Depth of strata. Total.</i>	
Loam and clay.....	20	White sand-rock.....	30 895
Shale.....	10 30	Gray shale.....	10 905
Limestone.....	40 70	Dark hard sand-rock.....	15 920
Shale.....	25 95	Gray shale.....	30 950
Limestone.....	20 115	Dark sand-rock.....	18 968
Shale and limestone.....	75 190	Black shale.....	20 988
Hard limestone.....	20 210	Coal.....	2 990
Shale and limestone.....	140 350	Fire-clay.....	10 1,000
Hard limestone.....	20 370	Sharp white sand-rock.....	40 1,040
White shale.....	35 405	Dark shale.....	20 1,060
Dark sand-rock.....	15 420	White sand-rock.....	10 1,070
Shale.....	135 555	Dark shale.....	20 1,090
Limestone.....	5 560	Dark sand-rock.....	15 1,105
Shale.....	25 585	Soft black shale.....	40 1,145
Limestone.....	10 595	Hard gray sand-rock.....	25 1,170
Shale.....	25 620	Black shale.....	5 1,175
Sand-rock.....	5 625	Hard white sand-rock.....	375 1,550
Shale.....	50 675	Brown limestone.....	20 1,570
Sand-rock.....	3 678	Iron pyrites.....	5 1,575
Shale.....	10 688	White shale.....	75 1,650
Sand-rock.....	5 693	Brown limestone.....	30 1,680
Shale.....	27 720	Light-gray limestone.....	30 1,710
Coal.....	2 722	Hard gray sand-rock.....	102 1,812
Clay and shale.....	25 747	Soft sharp sand-rock.....	18 1,830
Coal.....	2 749	White pebble sand-rock.....	40 1,870
Fireclay and shale.....	81 830	Hard white rock.....	50 1,920
Dark sand-rock.....	15 845	Soft blue sand-r'k, turning white, ..	90 2,010
White shale.....	20 865	Lower Helderburg limestone.....	106 2,116

In my opinion both oil and gas will be found near Leavenworth. With our present experience, and the information we have gained, the water could be cut off in another well, at 1,800 feet. The rock was very hard, and if the water had been shut off then—which it could have been—the well would have been a success. Our people, while disappointed, are not discouraged, and I believe the day will come when we will make another venture with more success.

THE TRIASSIC ROCKS OF KANSAS.

BY ROBERT HAY, JUNCTION CITY.

[*Abstract.*]

In this paper the writer gave at greater length a description of the triangular region whose base stretches on the southern State line from east of Caldwell to west

of Ashland, and whose apex is in the northern part of Kingman county, than was given in the lecture of the preceding evening. He also inferred from the borings at Salina, Ellsworth and Russell, that the triangular form was continued in the subterranean development of the red-beds, and that Ellsworth was within, but near the apex of it. The main feature of the paper, in which its scientific bearing is of great importance, was the statement, also made in the lecture of the previous evening, that the saliferous shales and beds of rock salt which lie beneath the Triassic red-beds were continuous downward with them, and also were continued down without break into the Permo-Carboniferous formations. That is, that in southern Kansas—and presumably in the Indian country beyond—there is no break from Paleozoic to Mesozoic time.

This is not absolutely affirmed, but the writer believes that the great mass of the evidence so far tends that way.

NOTE.—Just before this goes to press, the writer has made other observations in Kingman and Sumner counties, and finds outcrop of the red-beds six miles west of Wellington, and the proof more positive that they are continuous with the gray shales below, and that these shales, extending to and beyond Wellington, all belong to the saliferous horizon.—R. H.

THE LOGAN COUNTY NICKEL MINES.

BY PROF. F. H. SNOW, OF THE UNIVERSITY OF KANSAS.

While engaged in collecting specimens of Natural History in Wallace and Logan counties in August, 1888, I learned that considerable excitement had been produced in the central portion of the latter county by the discovery of valuable metallic ores. The first reports specified silver as occurring in paying quantities in that region, but later advices substituted nickel for silver, without any abatement of the popular excitement. I lost little time in making my way to the scene of commotion, and found the center of the new mining region in the southwest quarter of section 2, township 14, range 46, west of the 6th principal meridian. This quarter-section is three miles south of the Smoky Hill river, eight and one-half miles distant from Russell Springs, the county seat of Logan county, fifteen miles a little west of south from Winona, and eighteen miles a little south of east from Wallace, the county seat of Wallace county. It is about forty-five miles east of the western boundary, and seventy-five miles south of the northern boundary of the State of Kansas. Upon reaching this locality, I found that although less than two weeks had elapsed since the announcement was first made of the discovery of these mineral deposits, more than 400 acres of ground had been staked off for mining claims, and the excitement was becoming more intense every day. Hundreds of people were coming and going, and the once peaceful prairie had suddenly assumed the boisterous character of a genuine mining camp. The nomenclature of the claims indicates that Kansas can vie with Colorado and Arizona in the use of expressive language. The following are the names by which some of the prospect holes have been christened: Western Chief, Nickel King, Nickel Queen, Eli, Jimmie, Eureka, Nickel Cañon, etc..

Values of these mining claims had not found a definite basis; \$20,000 was reported to have been offered and refused for the two best claims, and five hundred dollars had been indignantly rejected for a half-interest in a less promising mine.

I was especially interested in visiting this spot because in former years, in company with Professor Mudge, and subsequently with parties of University students, I had explored the rocks in the immediate vicinity in search of vertebrate fossils. It was within twenty-five miles of this locality that in 1878 I had the good fortune to discover the now famous saurian, whose remains are so perfectly preserved that even